

# **EXPERIMENTAL MODELING OF SYNCHRONIZATION IN TWO BI-DIRECTIONALLY COUPLED CHAOTIC SYSTEMS**

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## **Abstract**

We report experimental results of bi-directional coupling between a Chua circuit and a plasma discharge. In spite of the different nature of the two systems, when properly coupled the two systems are capable of developing phase synchronous states. Moreover, for weaker coupling, it is found that the mean time  $\tau$  between consecutive  $2\pi$  phase slips obeys the scaling power law associated with unstable-unstable pair bifurcation crisis. As a theoretical analog, we use numerical simulations to synchronize a variety of coupled chaotic systems. Such models provide a framework to gauge behavioral characteristics of experimental results.